the journal of steroid biochemistry

Table of Contents, Subject and Author Index
Volume 30, Number 1–6

RECENT ADVANCES IN STEROID BIOCHEMISTRY

Proceedings of the Eighth International Symposium of *The Journal of Steroid Biochemistry*

Paris, France, 24–27 May 1987

Pergamon Press

Oxford New York Beijing Frankfurt São Paulo Sydney Tokyo Toronto

EDITORS-IN-CHIEF

J. R. PASQUALINI and R. SCHOLLER,
Foundation for Hormone Research,
26 Boulevard Brune, 75014-Paris, France

ASSOCIATE EDITORS

H. ADLERCREUTZ, Helsinki, Finland
M. BEATO, Marburg/Lahn, F.R.G.
J. CRABBÉ, Brussels, Belgium
E. GURPIDE, New York, U.S.A.
J-Å. GUSTAFSSON, Huddinge, Sweden
E. V. JENSEN, Zurich, Switzerland
A. E. KELLIE, London, England
M. E. LIPPMAN, Bethesda, U.S.A.
L. MARTINI, Milan, Italy
A. MUNCK, Hanover, NH, U.S.A.
B. W. O'MALLEY, Houston, TX, U.S.A.
D. O. TOFT, Rochester, MN, U.S.A.

CORRESPONDING EDITORS

A. AAKVAAG, Bergen, Norway
S. ANANCHENKO, Moscow, U.S.S.R.
F. AURICCHIO, Naples, Italy
P. L. BALLARD, San Francisco, U.S.A.
P. A. BELL, East Hanover, U.S.A.
E. W. BERGINK, Oss, The Netherlands
J. BLAQUIER, Buenos Aires, Argentina
R. BOUILLON, Leuven, Belgium
S. BOURGEOIS, San Diego, U.S.A.
A. BRODIE, Baltimore, U.S.A.
K. J. CATT, Bethesda, U.S.A.
L. CEDARD, Paris, France
J. A. CIDLOWSKI, Chapel Hill, U.S.A.
J. H. CLARK, Houston, U.S.A.
G. DAXENBICHLER, Innsbruck, Austria
L. DEHENNIN, Fresnes, France
E. R. DESOMBRE, Chicago, U.S.A.
M. L. DUFAU, Bethesda, U.S.A.
H. A. ERIKSSON, Stockholm, Sweden
J. FISHMAN, New York, U.S.A.
K. FOTHERBY, London, England
J. W. FUNDER, Melbourne, Australia
G. GREENE, Chicago, U.S.A.
K. GRIFFITHS, Cardiff, Wales
B. GRONER, Bern, Switzerland
V. HANSSON, Oslo, Norway
K. B. HORWITZ, Denver, U.S.A.
I. HUHTANIEMI, Turku, Finland
D. R. IDLER, Newfoundland, Canada
V. H. T. JAMES, London, England
J. KATO, Yamanashi-ken, Japan
B. S. KATZENELLENBOGEN, Urbana, U.S.A.
A. M. KAYE, Rehovot, Israel
R. J. B. KING, London, England
F. LABRIE, Quebec, Canada
C. P. LANTOS, Buenos Aires, Argentina
S. LIAO, Chicago, U.S.A.
P. C. MACDONALD, Dallas, U.S.A.
B. S. MCEWEN, New York, U.S.A.
W. L. MCGUIRE, San Antonio, U.S.A.
E. MENINI, Rome, Italy
E. MILGROM, Le Kremlin-Bicêtre, France
W. R. MILLER, Edinburgh, Scotland
T. MULDOON, Augusta, U.S.A.
J. MÜLLER, Zurich, Switzerland
B. E. P. MURPHY, Montreal, Canada
M. NEVES-E-CASTRO, Lisbon, Portugal
M. I. NEW, New York, U.S.A.
A. W. NORMAN, Riverside, U.S.A.
H. OKADA, Kyoto, Japan
M. J. PARKER, London, England
G. PÉREZ-PALACIOS, Mexico City, Mexico
W. B. PRATT, Ann Arbor, U.S.A.
J.-P. RAYNAUD, Paris, France
G. ROUSSEAU, Brussels, Belgium
W. T. SCHRADER, Houston, U.S.A.
K. SCHUBERT, Jena, G.D.R.
M. SERIO, Florence, Italy
J. SJÖVALL, Stockholm, Sweden
A. SPÄT, Budapest, Hungary
L. STÁRKA, Prague, Czechoslovakia
C. SUMIDA, Paris, France
J. R. TATA, London, England
W. TAYLOR, Tynemouth, England
P. TUOHIMAA, Tampere, Finland
S. ULICK, New York, U.S.A.
G. VERHOEVEN, Leuven, Belgium
A. VERMEULEN, Ghent, Belgium
R. VIHKO, Oulu, Finland
C. A. VILLEE, Boston, U.S.A.
K. D. VOIGT, Hamburg, F.R.G.
A. E. WAKELING, Macclesfield, England
C. R. WIRA, Hanover, U.S.A.

Publishing Office
Journals Production Unit, Pergamon Press plc, Hennock Road, Marsh Barton, Exeter, Devon EX2 8NE, England
(*Tel.* Exeter (0392) 51558; *Telex* 42749)

Subscription and Advertising Offices
North America: Pergamon Press Inc., Maxwell House, Fairview Park, Elmsford, NY 10523, U.S.A.
Rest of the World: Pergamon Press plc, Headington Hill Hall, Oxford OX3 0BW, England
(*Tel.* Oxford (0865) 64881)

Subscription per annum (1988), *including postage and insurance. Annual institutional subscription rate* (1988) DM 1735.00; *2-year institutional rate* (1988/89) DM 3296.50; *personal subscription rate for those whose library subscribes at the regular rate* (1988) DM 176. *Payments to be made in advance. Prices are subject to amendment without notice.*

Microform Subscriptions and Back Issues: Back issues of all previously published volumes are available direct from Pergamon Press. Back issues of Pergamon journals in microform can be obtained from UMI, 300 North Zeeb Road, Ann Arbor, MI 48106, U.S.A.

Published 18 issues/annum

Copyright © 1988 Pergamon Press plc

It is a condition of publication that manuscripts submitted to this journal have not been published and will not be simultaneously submitted or published elsewhere. By submitting a manuscript, the authors agree that the copyright for their article is transferred to the publisher if and when the article is accepted for publication. However, assignment of copyright is not required from authors who work for organizations which do not permit such assignment. The copyright covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microform or any other reproductions of similar nature and translations. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying, recording or otherwise, without permission in writing from the copyright holder.

Photocopying information for users in the U.S.A.
The Item-fee Code for this publication indicates that authorization to photocopy items for internal or personal use is granted by the copyright holder for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service provided the stated fee for copying, beyond that permitted by Section 107 or 108 of the U.S. Copyright Law, is paid. The appropriate remittance of $3.00 per copy per article is paid directly to the Copyright Clearance Center Inc., 27 Congress Street, Salem, MA 01970, U.S.A.

Permission for other use
The copyright owner's consent does not extend to copying for general distribution, for promotion, for creating new works or for resale. Specific written permission must be obtained from the publisher for such copying.

The Item-fee Code for this publication is: 0022-4731/88 $3.00 + 0.00

CONTENTS

RECENT ADVANCES IN STEROID BIOCHEMISTRY
PROCEEDINGS OF THE EIGHTH INTERNATIONAL SYMPOSIUM OF *THE JOURNAL OF STEROID BIOCHEMISTRY*

Preface ix

List of Participants xi

I. Steroid Receptors: Structure and Function, and Steroid Regulation of Transcription of Eukaryotic Genes

David F. Smith, Daniel J. McCormick and David O. Toft 1 Studies with antibodies against the conserved cysteine region of progesterone receptor

Susan J. Quirk and John W. Funder 9 Steroid receptors, and the generation of closely coupled/biphasic dose–response curves

Riitta A. Keinänen, Marja-Leena Laukkanen and Markku S. Kulomaa 17 Molecular cloning of three structurally related genes for chicken avidin

Thomas G. Muldoon, Gary H. Watson, A. Craig Evans Jr and Jaime Steinsapir 23 Microsomal receptor for steroid hormones: functional implications for nuclear activity

Leonor Cancela, Ilka Nemere and Anthony W. Norman 33 $1\alpha,25(OH)_2$ vitamin D_3: a steroid hormone capable of producing pleiotropic receptor-mediated biological responses by both genomic and nongenomic mechanisms

Donald P. McDonnell, J. Wesley Pike and Bert W. O'Malley 41 The vitamin D receptor: a primitive steroid receptor related to thyroid hormone receptor

Malcolm G. Parker, Paul Webb, John S. Mills, Maurice Needham and Roger White 47 Analysis of regulatory sequences in androgen-responsive genes

II. Steroids and Cancer, including Growth Factors and Effects on Proliferation

Marc E. Lippman, Robert B. Dickson, Edward P. Gelmann, Neal Rosen, Cornelius Knabbe, Susan Bates, Diane Bronzert, Karen Huff and Attan Kasid 53 Growth regulatory peptide production by human breast carcinoma cells

E. Brad Thompson, Y-S. Yuh, J. Ashraf, B. Gametchu, B. Johnson and J. M. Harmon 63 Mechanisms of glucocorticoid function in human leukemic cells: analysis of receptor gene mutants of the activation-labile type using the covalent affinity ligand dexamethasone mesylate

Barry M. Markaverich, Rebecca R. Roberts, Mary A. Alejandro, Gregory A. Johnson, Brian S. Middleditch and James H. Clark 71 Bioflavonoid interaction with rat uterine type II binding sites and cell growth inhibition

Walter F. Mangel, Diana L. Toledo, Ann M. Nardulli, Georg C. A. Reiner, Mary J. Norman and Benita S. Katzenellenbogen 79 Plasminogen activators in human breast cancer cell lines: hormonal regulation and properties

P. M. Guyre, M. T. Girard, P. M. Morganelli and P. D. Manganiello 89 Glucocorticoid effects on the production and actions of immune cytokines

R. I. Nicholson, K. E. Gotting, J. Gee and K. J. Walker 95 Actions of oestrogens and antioestrogens on rat mammary gland development: relevance to breast cancer prevention

Italo Nenci, Elisabetta Marchetti and Patrizia Querzoli 105 Commentary on human mammary preneoplasia. The estrogen receptor-promotion hypothesis

Fernand Labrie, Andre Dupont, Lionel Cusan, Michel Giguere, Nicole Bergeron, Jean-Pierre Borsanyi, Yves Lacourciere, Alain Belanger, Jean Emond, Gerard Monfette, Helene Boucher and Roger Lachance	107	Combination therapy with flutamide and castration (LHRH agonist or orchiectomy) in previously untreated patients with clinical stage D2 prostate cancer: today's therapy of choice
H. Klein, M. Bressel, H. Kastendieck and K. D. Voigt	119	Quantitative assessment of endogenous testicular and adrenal sex steroids and of steroid metabolizing enzymes in untreated human prostatic cancerous tissue
		III. Steroids in Pharmacology
C. Wayne Bardin, Glen L. Gunsalus, Neal A. Musto, C. Yan Cheng, Jaume Reventos, Carolyn Smith, D. Alan Underhill and Geoffrey Hammond	131	Corticosteroid binding globulin, testosterone-estradiol binding globulin, and androgen binding protein belong to protein families distinct from steroid receptors
A. E. Wakeling and J. Bowler	141	Biology and mode of action of pure antioestrogens
M. L. Casey, C. H. L. Shackleton and P. C. MacDonald	149	Dehydroepiandrosterone therapeutics: acetylation of DHA in mouse liver
Anikó Náray-Fejes-Tóth, Bernd Rosenkranz, Jürgen C. Frölich and Géza Fejes-Tóth	155	Glucocorticoid effect on arachidonic acid metabolism *in vivo*
		IV. Steroids and Neuroendocrine Function
Bernard Kerdelhué, Patricia Parnet, Veronique Lenoir, Alain Schirar, Florence Gaudoux, Marie-Claire Levasseur, Miklos Palkovits, Catherine Blacker and Robert Scholler	161	Interactions between 17β-estradiol and the hypothalamo–pituitary β-endorphin system in the regulation of the cyclic LH secretion
George Fink	169	Oestrogen and progesterone interactions in the control of gonadotrophin and prolactin secretion
Bruce S. McEwen	179	Genomic regulation of sexual behavior
Satya P. Kalra, L. Gregory Allen, Abhiram Sahu, Pushpa S. Kalra and William R. Crowley	185	Gonadal steroids and neuropeptide Y-opioid–LHRH axis: interactions and diversities
F. Naftolin, N. J. MacLusky, C. Z. Leranth, H. S. Sakamoto and L. M. Garcia-Segura	195	The cellular effects of estrogens on neuroendocrine tissues
		V. Poster Presentations
O. Bakker, A. T. Das and G. Ab	209	Protein–DNA interactions *in vitro* with 5′-flanking DNA fragments from the chicken vitellogenin gene
N. Giambiagi and J. R. Pasqualini	213	Immunological differences between the estradiol–, tamoxifen– and 4-hydroxytamoxifen–estrogen receptor complexes detected by two monoclonal antibodies
Nooshine Dayani, Reid W. McNaught and Roy G. Smith	219	ATP mediated receptor interconversion as a model of estrogen action: isolation of the factor which converts the non-estrogen binding form of the receptor to the lower affinity binding form
M. N. Alexis, L. Baki, Ch. Elefteriou and C. E. Sekeris	225	Glucocorticoid receptor structure as probed by endogenous proteases
Judy E. Stern and Charles R. Wira	233	Progesterone regulation of secretory component (SC): uterine SC response in organ culture following *in vivo* hormone treatment
Denis M. Boyle and L. Andre van der Walt	239	Enhanced phosphorylation of progesterone receptor by protein kinase C in human breast cancer cells
James Meador, T. Toney Ilenchuk and Marian R. Walters	245	Molybdate stabilized rat uterine progesterone receptors: evidence for two mechanisms

Farouk Radwan, Michel Carmel, Mostafa Elhilali, François Bouthillier and Jean-Guy Lehoux	251	Purification and characterization of the untransformed androgen receptor in rat prostate
A. O. Brinkmann, G. G. J. M. Kuiper, J. Bolt-de Vries and E. Mulder	257	*In situ* photolabelling of the human androgen receptor
Philip J. Weatherill, Anne P. M. Wilson, Robert I. Nicholson, Peter Davies and Alan E. Wakeling	263	Interaction of the antioestrogen ICI 164,384 with the oestrogen receptor
Emery H. Bresnick, Edwin R. Sanchez and William B. Pratt	267	Relationship between glucocorticoid receptor steroid-binding capacity and association of the M_r 90,000 heat shock protein with the unliganded receptor
M. Denis, A.-C. Wikström and J.-A. Gustafsson	271	Subunit composition of the molybdate-stabilized non-activated glucocorticoid receptor from rat liver
Scott Cuthill, Anna Wilhelmsson, Grant G. F. Mason, Mikael Gillner, Lorenz Poellinger and Jan-Åke Gustafsson	277	The dioxin receptor: a comparison with the glucocorticoid receptor
M. Denis, F. Guendouz, P. Blanchardie, S. Bernard and P. Lustenberger	281	Application of high-performance ion-exchange chromatography to the analysis of cytosolic glucocorticoid receptor
Donald J. Gruol, N. Faith Campbell and Suzanne Bourgeois	287	High-resolution anion exchange chromatography of the glucocorticoid receptor from WEHI-7 cells
Ghislaine Schweizer-Groyer, Françoise Cadepond, André Groyer, Thierry Idziorek, Marcel Mariller and Etienne E. Baulieu	291	Stimulation of specific transcription and DNA binding studies suggest that *in vitro* transformed RU 486-glucocorticosteroid receptor complexes display agonist activity
Jean-Guy Lehoux, Carole Allard, François Bouthillier, Serge Bélisle and Diégo Bellabarba	295	Aldosterone nuclear receptors in kidneys of chick embryo
A. Vessieres, G. Jaouen, M. Gruselle, J. L. Rossignol, M. Savignac, S. Top and S. Greenfield	301	Synthesis and receptor binding of polynuclear organometallic estradiol derivatives
Grant G. F. Mason, Anna Wilhelmsson, Scott Cuthill, Mikael Gillner, Lorenz Poellinger and Jan-Åke Gustafsson	307	The dioxin receptor: characterization of its DNA-binding properties
Marco M. Gottardis, Simon P. Robinson and V. Craig Jordan	311	Estradiol-stimulated growth of MCF-7 tumors implanted in athymic mice: a model to study the tumoristatic action of tamoxifen
B. N. Díaz-Chico, Y. Ogasawara, G. C. Chamness, M. Salman and W. L. McGuire	315	A 46-kDa antigen associated with estrogen receptor in human breast cancer
C. Gelly and J. R. Pasqualini	321	Effect of tamoxifen and tamoxifen derivatives on the conversion of estrone-sulfate to estradiol in the R-27 cells, a tamoxifen-resistant line derived from MCF-7 human breast cancer cells
Lawrence B. Hendry and Thomas G. Muldoon	325	Actions of an endogenous antitumorigenic agent on mammary tumor development and modeling analysis of its capacity for interacting with DNA
Pentti Tuohimaa, Arja Niemelä and Timo Ylikomi	329	Immunological similarities between microsomal, cytosolic and nuclear progesterone receptors in the chick oviduct
E. Dartois and M. M. Bouton	333	Inhibition by glucocorticoids of PGE_2 and ACTH secretion induced by phorbol esters and EGF in rat pituitary cells
J. Andersen and H. Skovgaard Poulsen	337	Immunohistochemical analysis of estrogen receptors (ER) using formalin-fixed paraffin-embedded breast cancer tissue: correlation with clinical endocrine response
C. L. Eaton, P. Davies and M. E. A. Phillips	341	Growth factor involvement and oncogene expression in prostatic tumours

Andrea Fabbri and Maria L. Dufau	347	Hormonal regulation of β-endorphin in the testis
I. Jung-Testas, J. M. Gasc and E. E. Baulieu	353	Effects of androgen and antiandrogen on growth, morphology and synthesis of specific proteins in mouse mammary carcinoma cells
F. De Cicco, G. Sica, M. T. Benedetto, G. Ciabattoni, F. Rossiello, A. Nicosia, G. Lupi, F. Iacopino, S. Mancuso and S. Dell'Acqua	359	*In vitro* effects of β-interferon on steroid receptors and prostaglandin output in human endometrial adenocarcinoma
L. Danel, C. Vincent, F. Rousset, B. Klein, R. Bataille, M. Flacher, B. G. M. Durie and J. P. Revillard	363	Estrogen and progesterone receptors in some human myeloma cell lines and murine hybridomas
M. O. Joly-Pharaboz, V. Albaladejo, Y. Morel, J. Trouillas and J. Andre	369	Inhibition of the $MtTF_4$ tumor growth by dexamethasone
R. Fässler, H. Dietrich, G. Krömer, S. Schwarz, H.-P. Brezinschek and G. Wick	375	Diminished glucocorticoid tonus in obese strain (OS) chickens with spontaneous autoimmune thyroiditis: increased plasma levels of a physicochemically unaltered corticosteroid-binding globulin but normal total corticosterone plasma concentration and normal glucocorticoid receptor contents in lymphoid tissues
S. Chasserot-Golaz, C. Schuster, J. B. Dietrich, G. Beck and D. A. Lawrence	381	Antagonistic action of RU38486 on the activity of transforming growth factor-β in fibroblasts and lymphoma cells
W. Wouters, R. De Coster, N. Geominne, D. Beerens and J. van Dun	387	Aromatase inhibition by the antifungal ketoconazole
D. Guidici, G. Ornati, G. Briatico, F. Buzzetti, P. Lombardi and E. di Salle	391	6-Methylenandrosta-1,4-diene-3,17-dione (FCE 24304): a new irreversible aromatase inhibitor
E. Petrangeli, F. Sciarra, F. Di Silverio, V. Toscano, C. Lubrano, C. Conti and G. Concolino	395	Effects of two different medical treatments on dihydrotestosterone content and androgen receptors in human benign prostatic hyperplasia
Marie-Lise Thieulant, Hans Fogh, Edith Saint Dizier and Jacques Duval	401	5α-DHT metabolism in monolayer cultures of distinct pituitary cell populations
H. Cohen, P. Guillaumot and I. Sabbagh	407	Dissociated estradiol (E_2) action on the pituitary–testicular axis in a genetically hypoprolactinemic rat (IPL nude rat)
B. D. Allen, W. Sutanto and M. T. Jones	411	A correlative study of RU38486 biopotency and competition with [^{3}H]dexamethasone for receptors in the rat central nervous system
W. Sutanto, J. M. H. M. Reul, J. A. M. van Eekelen and E. R. de Kloet	417	Corticosteroid receptor analyses in rat and hamster brains reveal species specificity in the type I and type II receptors
Thomas Hermann and Rüdiger Ghraf	421	Investigation of the corticosteroid receptor system in rat hippocampus by ion exchange fast protein liquid chromatography
David A. Sullivan	429	Influence of the hypothalamic–pituitary axis on the androgen regulation of the ocular secretory immune system
T. H. Schürmeyer, B. T. Gallucci and T. P. Tomai	435	Suppression of basal plasma cortisol and adrenal androgen concentrations, but not of ACTH and cortisol responses to hCRH by low-dose dexamethasone in rhesus monkeys
Monique Bedin, Thérèse Fournier, Nadia Mouhadjer and Georges Pointis	439	Ontogenesis and regulation of steroid sulfatase activity in Leydig cells and seminiferous tubules in the Long–Evans rat
A. M. Morera, C. Cochet, M. Keramidas, M. A. Chauvin, E. de Peretti and M. Benahmed	443	Direct regulating effects of transforming growth factor β on the Leydig cell steroidogenesis in primary culture
S. Carreau, V. Papadopoulos, N. Boujrad and M. A. Drosdowsky	449	Effects of cisplatin and bleomycin on mature rat Leydig cell testosterone production
N. Blanchouin-Emeric, M. Zenatti, G. Defaye and B. Aupetit	453	Verapamil directly inhibits aldosterone synthesis by adrenal mitochondria *in vitro*

Chantal Dauphin-Villemant, François Leboulenger, Françoise Xavier and Hubert Vaudry	457	Interrenal activity in the female lizard *Lacerta vivipara* J.: *in vitro* response to ACTH 1–39 and to [Sar[1], Val[5]]angiotensin (ANG II)
C. Delarue, I. Lihrmann, M. Feuilloley, P. Netchitaïlo, S. Idres, F. Leboulenger, A. Bélanger, I. Perroteau and H. Vaudry	461	*In vitro* study of frog adrenal function—IX. Evidence against the involvement of lipoxygenase metabolites in the control of steroid production
Marc Feuilloley, Pierre Netchitaïlo, Catherine Delarue, François Leboulenger, Mohamed Benyamina and Hubert Vaudry	465	Effect of the intermediate filament inhibitor IDPN on steroid secretion by frog adrenal glands
Antoinette Viger, Suzy Coustal, Serge Perard, Bertrand Chappe and Andrée Marquet	469	Synthesis and activity of new inhibitors of aldosterone biosynthesis
Timo Ylikomi and Pentti Tuohimaa	473	Sex-steroid-sensitive stromal cells and oviduct differentiation
Marielle Angeli, Anne-Marie Moura and Manuel Worcel	477	Interaction between aldosterone and vasopressin vascular smooth muscle permeability to sodium
W. Savino, E. Bartoccioni, F. Homo-Delarche, M. Cl. Gagnerault, T. Itoh and M. Dardenne	479	Thymic hormone containing cells—IX. Steroids *in vitro* modulate thymulin secretion by human and murine thymic epithelial cells
A. D. Tait and L. C. Hodge	485	Adrenal androgen biosynthesis by a sesterpene pathway
M. J. Reed, L. C. Lai, M. W. Ghilchik and V. H. T. James	489	The effects of androgens and cortisol on the *in vivo* metabolism of oestradiol